

The Suck, Snout, Palmomental, and Grasp Reflexes

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Definition

The *suck reflex* consists of sucking movements by the lips when they are stroked or touched. The *snout reflex* involves puckering or protrusion of the lips with percussion. The muscles around the mouth and base of the nose contract. In the *palmomental reflex*, a stimulus to the thenar area of the hand causes a reflex contraction ipsilaterally of the orbicularis oris and mentalis muscles.

These "primitive" reflexes are covered together since they have certain common features. The first three were referred to briefly in Table 62.1 in the chapter on the facial nerve, since that nerve participates in them. They are normal in infants, present in a certain number of normal individuals, and occur in a larger number of patients with neurologic disease.

Technique

The suck reflex is elicited by lightly touching or tapping on the lips with an object such as a tongue blade, reflex hammer, or the examiner's finger. At times the reflex is obtained merely by approaching the lips with an object.

The snout reflex is brought about by tapping the upper lip lightly. The contraction of the muscles causes the mouth to resemble a snout.

The palmomental reflex occurs when a disagreeable stimulus is drawn from the thenar eminence at the wrist up to the base of the thumb. There is ipsilateral contraction of the orbicularis oris and mentalis muscles. The skin over the chin wrinkles, and the corner of the mouth elevates slightly.

The grasp reflex is obtained when the examiner's hand is gently inserted into the palm of the patient's hand. A distraction such as ongoing conversation with the patient is useful. The palmar surface is stroked or simply touched. The flexor surfaces of the fingers may be stimulated also by the examiner's fingers. The stimulus should be in a distal direction. With a positive response, the patient grasps the examiner's hand with variable strength and continues to grasp as the examiner's hand is moved. Ability to release the grip voluntarily depends on the activity of the reflex; some patients can do so readily, while others can even be lifted off the bed, since the grasp has such power. A variant is to stroke the flexor surfaces of the patient's fingers. With positive responses, the fingers will curve much like a bird's claw and hook the examiner's fingers or hands. Some clinicians maintain that the reflex is brought out more easily if the patient is lying on the side with the hand to be tested uppermost.

A foot grasp reflex can be elicited by stroking gently the plantar surface medially with a blunt object such as the handle of a reflex hammer. The lateral surfaces of the foot bend as if to make a cup out of the plantar surface. The toes adduct; there is hollowing of the sole with some wrin-

king of the skin. If the toes also flex, this is called the tonic foot response. In patients who also have the Babinski reflex, the Babinski can usually be elicited more laterally than the grasp.

Basic Science

The grasp reflex ("forced grasping") was reported by Adie and Critchley in 1927 to be a manifestation of frontal lobe disease. Experimental and clinical cases have shown it to be due to lesions of the supplementary motor area, which is located just anterior to the foot area on the medial surface of the frontal lobe. The suck, snout, and palmomental reflexes are present with frontal lobe disease also. They are often referred to collectively as "frontal release" signs, primitive or archaic reflexes, or atavistic reflexes. They are seen in disorders that affect the frontal lobes, such as dementias, metabolic encephalopathies, closed head trauma, and hydrocephalus. All of these disorders produce diffuse cerebral damage, and obviously usually involve many areas and systems in addition to the frontal lobes and pyramidal system.

Clinical Significance

The grasp reflex is fairly specific for a lesion of the supplementary motor area on the medial surface of the contralateral frontal lobe. A grasp of the ipsilateral frontal lobe is said to be more commonly present with right hemispheric disease (Mori and Yamadori, 1985). All of these reflexes, including the grasp reflex, are seen in infancy, up until about one year of age. After that time a significant number of normal individuals can have suck, snout, and palmomental reflexes. In one study (Martí-Vilalta and Graus, 1984) the palmomental reflex was found in 25% of healthy newborn children, 11% of healthy adults, and 72% of adults with neurologic disease (dementia, Parkinson's disease, various lesions of the pyramidal tracts). In another study (Isakov et al., 1984) the authors were unable to demonstrate significant differences in the occurrence of the snout and palmomental reflexes between a group of normal individuals and a group with neurologic disease. They did find that the occurrence of more than one of the reflexes happened more often in patients with neurologic disease. A recent study demonstrates significant differences, however, between normal subjects and patients with parkinsonism (Figure 71.1).

In summary, the occurrence of the grasp reflex can be taken to indicate disease of the supplementary motor area of the frontal lobe. The presence of the other reflexes can be seen often in normal individuals. They are seen more frequently in patients with diffuse cerebral disorders that affect the frontal lobes and pyramidal tracts. The occurrence of more than one of the reflexes in the same patient

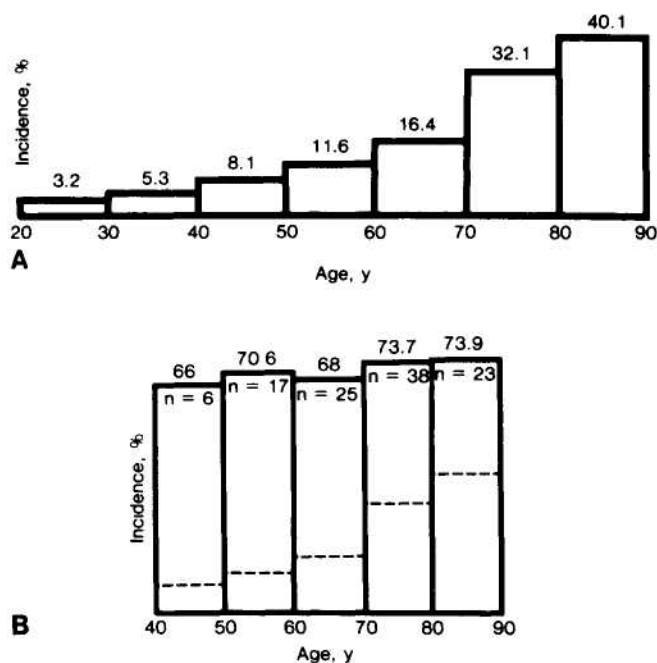


Figure 71.1
Incidence of the palmomental reflex, by age group, in (A) 356 normal subjects and (B) 109 parkinsonian patients. From deNoordhout AM, Delwaide PJ. The palmomental reflex in Parkinson's disease. *Arch Neurol* 1988;45:425-27. Used with permission.

is more suggestive of disease than normality. Habituation to the stimulus, that is, the reflex ceases after the stimulus is applied several times, is said to occur more often in normal individuals than in patients with neurologic disease.

References

- Adie WJ, Critchley M. Forced grasping and groping. *Brain* 1927;50:142-70.
- Botez MI, Bogen JE. The grasp reflex of the foot and related phenomena in the absence of other reflex abnormalities following cerebral commissurotomy. *Acta Neurol Scand* 1976;54:453-63.
- Brain WR, Curran RD. The grasp reflex of the foot. *Brain* 1932; 55:347-56.
- Brodal A. Neurological anatomy. 3rd ed. New York: Oxford University Press, 1981.
- DeJong RN. The neurologic examination. 4th ed. New York: Harper & Row, 1979.
- deNoordhout AM, Delwaide PJ. The palmomental reflex in Parkinson's disease. *Arch Neurol* 1988;45:425-27.
- Isakov E, Sazbon L, Costeff H, Luz Y, Najenson T. The diagnostic value of three common primitive reflexes. *Eur Neurol* 1984; 23:17-21.
- Mack EW. The palmomental reflex (letter). *Surg Neurol* 1987; 27:403.
- Magee KR. Clinical analysis of reflexes. In: Vinken PJ, Bruyn GW, eds. *Handbook of clinical neurology*. Amsterdam: North-Holland Publishing, 1969;1:237-56.
- Marti-Vilalta JL, Graus F. The palmomental reflex. *Eur Neurol* 1984;23:12-16.
- Mori E, Yamadori A. Unilateral hemispheric injury and ipsilateral instinctive grasp reaction. *Arch Neurol* 1985;42:485-88.
- Paulson GW. Some lesser-known reflexes in neurology. *Ohio State Med J* 1973;69:515-16.
- Pollack S. The grasp response in the neonate. *Arch Neurol* 1960;3:574-81.
- Seyffarth H, Denny-Brown D. The grasp reflex and the instinctive grasp reaction. *Brain* 1948;71:109-83.
- Whittle IR, Miller JD. The palmomental reflex (letter). *Surg Neurol* 1986;26:520-21.